

Dung Beetles (Coleoptera, Scarabaeidae) Collected from  
a Tropical Rain Forest of Kakamega, Kenya,  
with Some New Distributional Records

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**Abstract** Fifteen species of dung beetles (Scarabaeidae) are recorded from a tropical rain forest of Kakamega, Kenya. Of these, *Catharsius ninus*, *Diastellopalpus gilleti*, *Onthophagus depilis* and *Milichus inaequalis* are recorded from Kenya for the first time. These are the easternmost record for each of these newly recorded species.

African tropical rain forest, the second largest block of tropical rain forest of the world, centers on the Congo Basin and mainly covers Gabon, the Republic of the Congo (hereafter R. Congo) and northern part of the Democratic Republic of the Congo (hereafter D. R. Congo) and additionally southern parts of Nigeria, Cameroon and Central African Republic (PRIMACK & CORLETTE, 2005) (Fig. 1). It is also distributed along the coast of West Africa, mainly in Liberia, Ivory Coast and Ghana (PRIMACK & CORLETTE, 2005) (Fig. 1). Furthermore, there are several outlying “islands” of tropical rain forest in East Africa. These forest patches are considered the remnants of West and Central African tropical rain forest (the Guineo-Conglian forest) that extended east-

wards to cover what is now in Uganda and Kenya during the pluvial periods in the Pleistocene (more than 10,000 years before) (CAMBEFORT & WALTER, 1991; ROUND-TURNER, 1994).

The Kakamega forest in Kenya is one of the remnants of tropical rain forest in East Africa, harboring species that are possibly Central African origin and not found elsewhere in Kenya (ROUND-TURNER, 1994). However, little is known for the dung beetle fauna of Kakamega although some ecological studies have been conducted for effects of anthropogenic forest degradation on the dung beetle assemblage (MAHIVA *et al.*, 2004). Recently, the first author has had an opportunity to collect dung beetles in the Kakamega forest by courtesy of Dr. Naota OSAKI. Thus, we herewith record the dung beetles (Scarabaeidae) collected from the Kakamega forest and make a brief discussion on their biogeography.

### Study Site

The Kakamega forest covers an area of 240 km<sup>2</sup> at an altitude of 1,500–1,700 m, sitting about 50 km north to Kisumu City near Lake Victoria (Fig. 1). Annual precipitation is over 2,000 mm, the highest rainfall in Kenya (ROUND-TURNER, 1994). Most of rainfalls occur between April and November, with a short dry season from December to March. An annual mean maximum temperature is 27°C and a mean

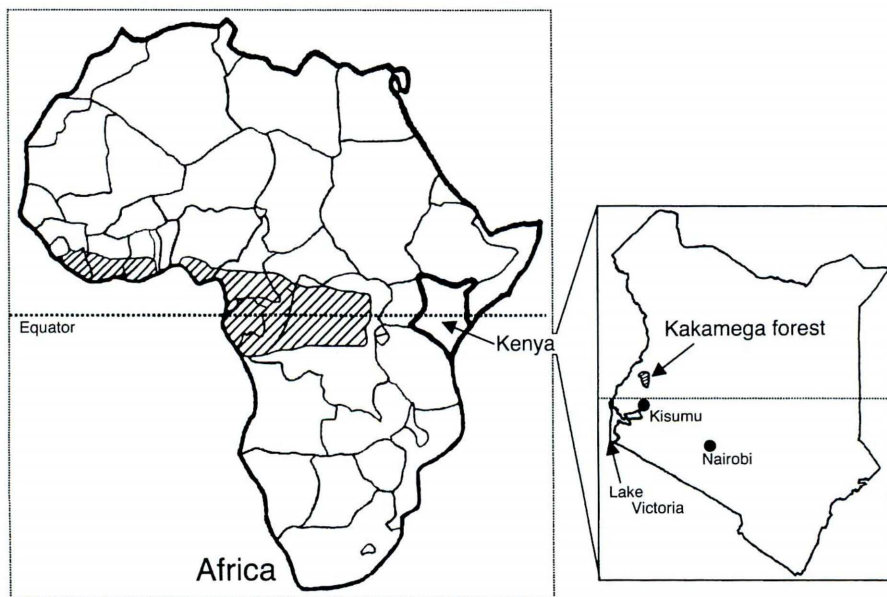


Fig. 1. The location of the Kakamega forest. Shaded are potential tropical rain forest areas estimated from the present climatic condition (after PRIMACK & CORLETT, 2005).

minimum 15°C. Temperature does not vary greatly throughout the year. There are bushbuck (*Tragelaphus scriptus*), duikers (*Cephalophus* spp.), baboon (*Papio anubis*), monkeys (*Cercopithecus* spp.) and bushpig (*Potamochoerus porcus*) as medium- to large-sized mammals (ROUND-TURNER, 1994).

### Methods

Dung beetles were collected by the first author, using pitfall traps (9.5 cm diameter, 11.5 cm depth) baited with either impala, baboon or cattle dung. The traps were buried in the soil with the opening at ground level. Trappings were made along a trail in the forest on 13–14, 20–21 and 27–28 August 2003. The trapped beetles were picked up on the next day after setting. Identification of some specimens beyond the generic level was not possible. Thus, in such cases, we utilized only generic names with a code assigned to each unidentified species within a genus. We referred to FERREIRA (1972) and some subsequent works for the distribution of each identified species (NUMMELIN & HANSKI, 1989; CAMBEFORT & WALTER, 1991; PALESTRINI, 1992; CAMBEFORT, 1996; JOSSO & PREVOST, 2000).

### Results

A total of 330 individuals, 15 species (4 of which have yet been unidentified beyond the generic level) belonging to 9 genera, were collected (Figs. 2–18). The three species of *Diastellopalpus*, *D. gilleti* (32.9%), *D. murrayi* (12.7%), *D. semirubidus* (14.2%), dominated in number. They also appeared to occupy the majority in biomass because *D. gilleti* and *D. semirubidus* are the largest species in the beetles collected in the present survey (Figs. 2–18).

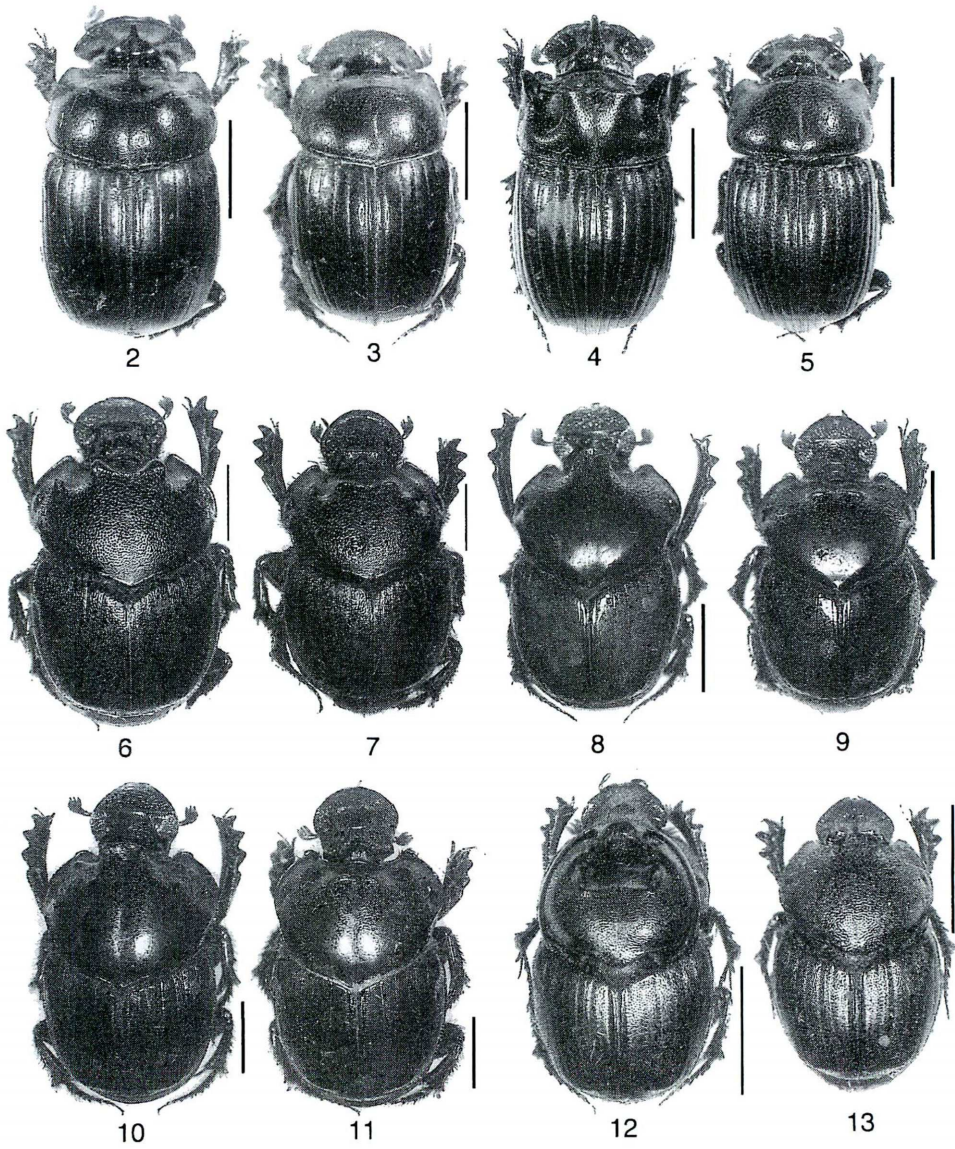
The four species, *Catharsius ninus*, *Diastellopalpus gilleti*, *Onthophagus depilis* and *Milichus inaequalis*, were recorded from Kenya for the first time. These are the easternmost record for each species. Listed below are the species of dung beetles (Scarabaeidae) collected in the present survey. We also provide what has been known for the distribution of each identified species.

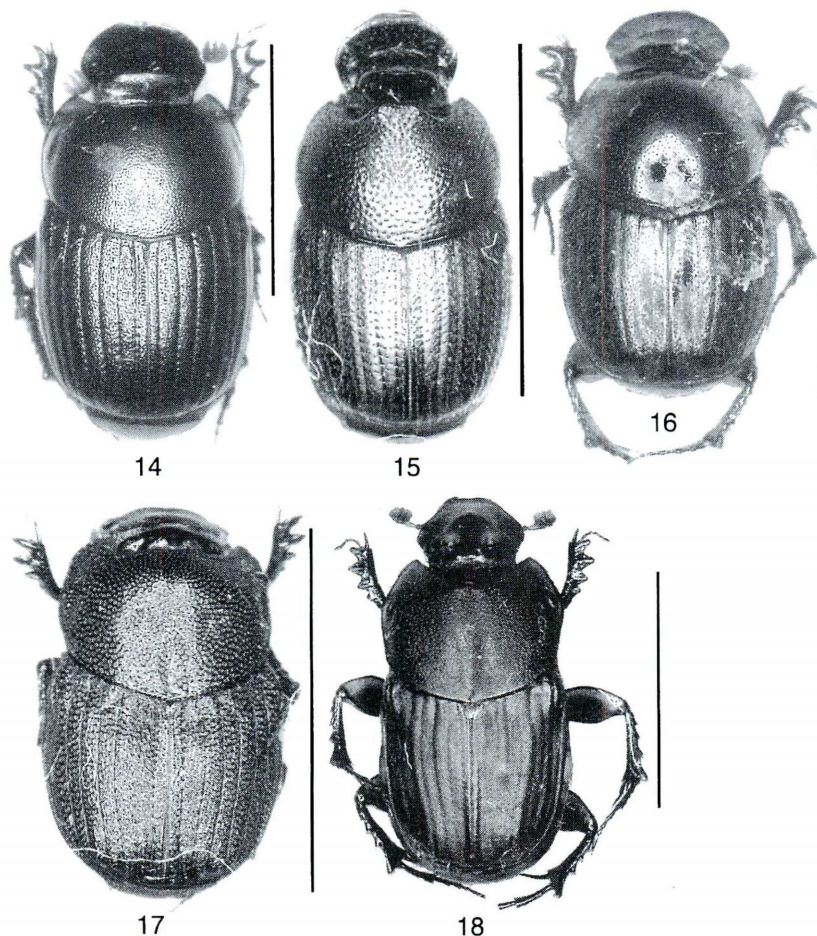
#### Tribe Sisyphini

*Sisyphus* sp. (undetermined)

*Specimens examined.* 17 exs., 14–VIII–2003.







Figs. 2-18 (on pp. 330-331). Habitus of dung beetles from the Kakamega forest, scale, 5 mm. —

2, *Catharsius ninus* GILLET, ♂; 3, ditto, ♀; 4, *Copris nepos* GILLET, ♂; 5, ditto, ♀; 6, *Diastellopalpus gilleti* D'ORBIGNY, ♂; 7, ditto, ♀; 8, *D. murrayi* (HAROLD), ♂; 9, ditto, ♀; 10, *D. semirubidus* D'ORBIGNY, ♂; 11, ditto, ♀; 12, *Proagoderus multicornis* (D'ORBIGNY), ♂; 13, ditto, ♀; 14, *Onthopohagus depilis* D'ORBIGNY; 15, *O. excisiceps* D'ORBIGNY; 16, *O. picatus* D'ORBIGNY; 17, *Milichus inaequalis* BOUCOMONT; 18, *Liatongus arrowi* BOUCOMONT.

Tribe Coprini  
*Catharsius ninus* GILLET  
(Figs. 2-3)

*Specimens examined.* 1♂, 3♀♀, 14-VIII-2003; 6♂♂, 4♀♀, 21-VIII-2003; 1♀, 28-VIII-2003.

*Distribution.* D. R. Congo, Uganda, Kenya (new record).

*Copris nepos* GILLET

(Figs. 4–5)

*Specimens examined.* 2♂♂, 5♀♀, 14–VIII–2003; 1♀, 21–VIII–2003.

*Distribution.* D. R. Congo, Rwanda, Burundi, Uganda, Kenya, Tanzania, Zambia.

Tribe Onthophagini

*Diastellopalpus gilleti* D'ORBIGNY

(Figs. 6–7)

*Specimens examined.* 43 exs., 14–VIII–2003; 61 exs., 21–VIII–2003; 5 exs., 28–VIII–2003.

*Distribution.* Cameroon, Central African Republic, Gabon, R. Congo, D. R. Congo, Kenya (new record).

*Diastellopalpus murrayi* (HAROLD)

(Figs. 8–9)

*Specimens examined.* 2 exs., 14–VIII–2003; 8 exs., 21–VIII–2003; 32 exs., 28–VIII–2003.

*Distribution.* Nigeria, Cameroon, Gabon, D. R. Congo, Kenya (Kakamega).

*Diastellopalpus semirubidus* D'ORBIGNY

(Figs. 10–11)

*Specimens examined.* 32 exs., 21–VIII–2003; 15 exs., 28–VIII–2003.

*Distribution.* Uganda, Kenya (Kakamega).

*Proagoderus multicornis* (D'ORBIGNY)

(Figs. 12–13)

*Specimens examined.* 8 exs., 14–VIII–2003; 12 exs., 21–VIII–2003; 3 exs., 28–VIII–2003.

*Distribution.* Cameroon, Central African Republic, Sudan, D. R. Congo, Uganda, Burundi, Kenya.



*Onthophagus depilis* D'ORBIGNY

(Fig. 14)

*Specimens examined.* 2 exs., 14-VIII-2003; 2 exs., 21-VIII-2003.*Distribution.* Ivory Coast, Cameroon, Gabon, D. R. Congo, Uganda, Kenya (new record).*Onthophagus excisiceps* D'ORBIGNY

(Fig. 15)

*Specimen examined.* 1 ex., 21-VIII-2003.*Distribution.* Cameroon, Central African Republic, R. Congo, D. R. Congo, Tanzania, Kenya, Ethiopia.*Onthophagus picatus* D'ORBIGNY

(Fig. 16)

*Specimens examined.* 9 exs., 14-VIII-2003; 7 exs., 21-VIII-2003; 36 exs., 28-VIII-2003.*Distribution.* Senegal, Guinea, Sierra Leone, Ivory Coast, Benin, Gabon, Central African Republic, R. Congo, D. R. Congo, Uganda, Kenya.*Onthophagus* sp. 1 (undetermined)*Specimens examined.* 2 exs., 28-VIII-2003.*Onthophagus* sp. 2 (undetermined)*Specimens examined.* 1♂, 1♀, 14-VIII-2003.*Caccobius* sp. (undetermined)*Specimens examined.* 3 exs., 14-VIII-2003.*Milichus inaequalis* BOUCOMONT

(Fig. 17)

*Specimens examined.* 1 ex., 14-VIII-2003; 1 ex., 21-VIII-2003.*Distribution.* Guinea, Ivory Coast, D. R. Congo, Uganda, Kenya (new record).

## Tribe Oniticellini

*Liatongus arrowi* BOUCOMONT

(Fig. 18)

*Specimens examined.* 1 ex., 14-VIII-2003; 2 exs., 21-VIII-2003.

*Distribution.* D. R. Congo, Rwanda, Uganda, Kenya.

## Discussion

It has been pointed out that the Kakamega forest has the unique flora and fauna derived from the Guineo-Congolian forest (ROUND-TURNER, 1994). This appears to be exemplified also by the present results for dung beetles, although the present sample size and survey period were limited. According to the available distribution data, most of the species collected in the present survey have also been recorded from some of West and Central African countries with tropical rain forest (although a few species also from apparently arid countries, such as Sudan or Ethiopia). Thus, it is suggested that the Kakamega forest harbors dung beetles derived from the Guineo-Congolian forest.

The forest dung beetle communities are generally fragile and vulnerable to forest degradation because they depend on adequate tree cover as well as the mammalian fauna providing food resource (CAMBEFORT & WALTER, 1991). We hope that the unique dung beetle fauna of the Kakamega forest will be conserved due to conservation efforts for the forest environment with all its biological richness.

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## 要 約

赤嶺真由美・P. MORETTO・越智輝雄・近 雅博：ケニアのカカメガの熱帯雨林で採集された糞虫といくつかの新分布記録。—— ケニアのカカメガの熱帯雨林で採集された糞虫 15 種を記録した。それらのうち、*Catharsius ninus*, *Diastellopalpus gilleti*, *Onthophagus depilis*, *Milichus inaequalis* の 4 種はケニアから初めて記録された。これらは、それぞれの種の最東端の分布記録となっている。



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## A New Locality of *Stenocladus yoshimasai* (Coleoptera, Lampyridae) from the Amami Islands, the Middle Ryukyus

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The luminescent beetle of the genus *Stenocladus*, *S. yoshimasai* KAWASHIMA was originally described from Amami-Ōshima Is. of the middle Ryukyus (KAWASHIMA, 1999, pp. 144–148, figs. 1–6, 8, 10–11 & 14). In 2005, the junior author was able to collect this species from Toku-no-shima Island of the same island group. We will record it below as its new locality and will illustrate the male genitalia in this short report.

*Specimens examined.* [Toku-no-shima Is., Amami Isls.] 7♂♂, 1 larva (younger instar), the upper course of the Akirigami-gawa Riv., Tokunoshima-chō, 16–XI–2005, F. SATOU leg.

*Distribution.* Amami Isls.: Amami-Ōshima Is. and Toku-no-shima Is. (new record).

*Notes.* In comparison of adult males from the two islands recorded above, they cannot be clearly discriminated from each other in the following external characteristics; 1) body size; 2)